

# **The Benefits of Compact Disc Interactive Mathematic as a Builder Democratic Mindset**

**Sub Tema: (Using Technology in Mathematics Education)**

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## **Abstract**

Currently, we are in the technology era, almost all elementary school students can be said to have known the compact disk (CD), especially those who have and love to operate the play station (PS). In action research that I have done, it can be concluded that the users of an interactive CD which contains material worth fractions on math, are able to build a democratic mindset. Data obtained from the action, before the material is taught, each student was given a CD to learn at home and ensured they were able to operate it. When learning activities, students are given the opportunity to explore their ability by what has been understood as a material after opening a representative of their group whereas the other students respond it. It needs an experienced teacher, who will be able to catch the establishment of a democratic mindset of the students, through attitude and action patterns. Students who have a high curiosity to learn the material, the spirit to convey what is already known, likes have the courage to ask, have the ability to choose a positive attitude. Ability to "capture" the ability of the teacher is not automatic, but it needs sharpened. Coaching and training with supervision are able to motivate educators to complete professionalism, so that interactive CD can be build a democratic mindset which needs professional teachers who are able to inspire them.

**Keywords:** interactive CD math, mindset, democratic

## **1. Introduction**

Currently, we are in the era of technology development, so that almost all elementary school (SD) can be said to have known the Compact Disk (CD), especially those who have and like to operate the play station (PS). The enjoyment of children playing computer and playing games, often make anxiety and fear of the parents on the negative repercussions that. Information Technology Era now is so rapidly and widely into the entire sector, without the exception of education sector. Speed to obtain information about world changing, demands and requires a faster learning ability, efficient and effective. Business Week magazine, in an article entitled "The Learning Evolution" reported the results of several studies showing that

many students absorb faster and longer to settle when the learning is delivered in visual and auditory form (with the perspective and hear) as in interactive multimedia known as SMART MATH. CAI (Computer Assisted Instruction) has stimulated the evolution of learning renewal of the current learning model "teacher-centered, lecture-based instruction" which is almost the same as 100 years ago to the learning model "student-centered, interactive learning environment". CAI is a device that combines learning and synergize all media consisting of text, images, animations, graphics, narration, and interactivity is programmed based on the theory of learning, thereby further enhancing absorption and interests of students towards the subject matter, especially in mathematics. The material on the CD Multimedia Learning is iterative Mathematics curriculum should be prepared based on the applicable according to the Ministry of National Education.

Mathematics is one of the most important aids science and useful in everyday life as well as in supporting the development of science and technology. Mathematics is a means of thinking to organize, develop the mindset of a logical, systematic, objective, critical and rational to be nurtured since the basic education. Therefore mathematics should be able to be one of the means to improve students' reasoning power and can improve the ability to meet the challenges of everyday life. However, to date student mastery of mathematics is still very low, it is reflected from the boundary passing a national exam results 2006/2007 junior year at 4.25 and none of the provinces in Indonesia reached 100% graduation rate, even most of the math still a lesson which causes most students do not pass, written Wassenaar, in Sumarni (2008). In addition, the majority of primary school teachers confirmed that students lack an understanding of the concepts and principles of mathematics since in SD, let alone implement it primarily on material fractions. According Arsyad (2011) so that students can learn fractions properly, students are required to master the basic capability equality of numbers, skills in comparison, with the same skill divide large, and have the courage expressed an opinion about another name fractions. Professional skills of the teachers need to be continuously trained and developed to deliver mathematics through interactive CD as the builder of a democratic mindset.

## **2. Study of Theory**

### **a. Benefits of Interactive CD**

The purpose of math learning software in the form of CD Interactive is for students to understand the basic concepts, the general shape of each material such as fractional valued and students are expected to develop the ability to solve problems and to train the way of thinking and reasoning in drawing conclusions. When students have the freedom to learn independently, knowledge of freedom of expression, the freedom to express his attitude, freedom to communicate success, then it is a process of awakening of democratic mindset. Learning software is interactive and innovative so that it can be used by students to learn independently or teachers in presenting the subject matter in the classroom. That is the knowledge, attitudes, and skills that students not only develop because of the presence of the teacher.

Benefits Mathematics Interactive CD for students to provide supplies of life, by increasing the absorption of students in mathematics; Finding joy in learning mathematics; Increase the interest of students to learning Mathematics; Improving students' ability to learn independently; Time efficiency in the mastery of the material; Students can find various forms of matter making it easier to focus on learning. Furthermore, the students became more focused when operating a computer, so students do not stutter technology; students to be brave and not afraid to try one. Benefits for teachers of Mathematics Interactive CD Allows teachers to prepare and present subject matter; Time to teach more quickly and efficiently; Reducing misconceptions in Mathematics; Assist teachers in the delivery of quality subject matter; Get a new better method to increase student participation in learning activities; Teaching becomes easier, the spirit and the results are devastating.

Teachers should utilize the finished product and the teachers make learning plan using an interactive CD by selecting the appropriate methods and strategies. Interactive CD will be more useful if it were given to students before the learning material presented in class, from self-learning experience students will appear many aspects that we can look at as a researcher and as a teacher. From the appearance that we look at, then there will be many aspects that we can develop and we communicate.

#### **b. Interactive CD that how?**

Learning is a complex process that happens to every person and lasted throughout his life. The process of learning can happen anytime and anywhere regardless there are teaching or not. Arsyad (2011) suggests, that the Cronbach Interaction and Motivation in Learning and Teaching provides a definition of learning is "Learning is shown by a change in behavior as a result of experience". Being Harold imposes limits on learning, "Learning is to Observe, to read, to imitate, to try something them-selves, to listen, to follow direction", and Geoch said "Learning is a change in performance as a result of practice". From the above definition it can be explained that learning is always a change in behavior or appearance, with a series of activities such as reading, watching, listening, imitating, and so forth. Also learned it would be better, if the study subjects having or doing, so do not be verbalistic. It means that in the process of learning mathematics is indispensable in the form of an interactive CD media as a tool to clarify the abstract mathematical objects.

Examples of Mathematics with Interactive CD worth of material fractions, containing the appropriate animation depicting the story about the formation fractions. As a mother carrying a souvenir of the apples that will be given to 2 children and cut into 2 equal parts, what fraction is received by each child? Supplied answer options ( $\frac{1}{4}$ ;  $\frac{1}{3}$ ;  $\frac{1}{2}$ ) if the student answers correctly then option automatically exit voice "yes really" accompanied applause as a form of motivation to the students and if the students answer the wrong choice then sound out "think again". About the next story, if the mother is carrying the apples had to be split equally to 4 children, what fraction is given to the second son? It is the same value between  $\frac{2}{4}$  with

$\frac{1}{2}$ ? Can you find another name for these two fractions? Write the fraction that is worth as much as you can other and discuss with your friends. In this problem students are expected to understand the concept that  $\frac{2}{4} = \frac{1}{2} = \frac{3}{6} = \frac{5}{10} = \dots$  and so on.

After students doing independent study operate interactive CD, teachers are expected to plan for observing students actually learn and which are not; ask what is already understood? (for the learned); constraints and asking what is causing the students do not learn? (for which has not been studied); motivating students to venture forth and express their opinions in accordance with the content that has been learned from the interactive CD, other students still continue to be motivated to ask and respond to what is presented about his friend. Teachers should try to motivate other students to dare to put forward another idea about the worth of the material fractions. For example,  $\frac{30}{45}$  by asking another name, in this case students

are given assistance in the form of the answer choices  $\{\frac{3}{4}; \frac{2}{3}; \frac{4}{6}\}$ , Each student or a representative of the group was given the opportunity to communicate the results of his thought. When students are able to say that in the answer choices are two answers correct, this means that reasoning and democratic mindset that has been deliberately constructed properly achieved. This means building a mindset is not easy because it takes a process and reflection skills and the ability to improve the ease of learning. Problem can be developed such as, what is the value of "a" if  $\frac{a}{3} = \frac{10}{15}$ ? Teachers can be creative in the development of problems such

as move the numbers in question, what is the value of "b" if  $\frac{4}{7} = \frac{12}{b}$ ? Furthermore, students in groups can also be given alternately challenge to create questions and answers of other groups.

### c. Thematic Learning and Scientific

The learning process requires detailed planning and focused on themes that have been, for example the theme of "family", then proceed with the implementation that is able to engage students actively, creatively and freely express their opinions match what is known. Active, creative, as well as the freedom students have to concern on cognitive, affective, and psychomotor. In the implementation, all of the sample questions used should be about "family" and can be attributed to Civics to instill fairness, harmony in the family, should not be jealous, as a form of thematic learning application. Furthermore, the successful implementation should be evaluated to see the achievement of the goals set.

In addition to the learning process should be thematic, learning should also scientific or scientific means teachers should implement various changes in the ability to observe the activities of students' knowledge, teachers are required to ask a variety of reasons why there is and not change attitudes or affective elements in their students. As a complement to the ability, students must also be provided psychomotor ability or skill, and when students are

already skilled tried to overcome the difficulties in solving the problems of his duties as a means students have been able to take advantage of the ability to reason as the application of critical thinking and rational, which is part of the democratic. Students who have dared to communicate what has been learned and experienced this should still get attention, given the opportunity to explain and motivated to continue to grow and can be used as an example to other friends.

#### **d. As Democratic Mindset Builders**

There are several types of democracy, but there are only two basic forms. Both explain how all the people running his wish. The first form of democracy is direct democracy, which all citizens participate directly and actively in government decision making. In most modern democracies, the entire people is still a sovereign power but political power is executed indirectly through representatives; this is called representative democracy, Kelsen (2006). In terms of democracy, contained the values of human rights, for democracy and human rights is a unity that cannot be separated from each other. A country that claims to be democratic practice must necessarily be consistent with the respect for human rights, for democracy without respect for the rights of every member of society, but democracy is not merely oppressive state, Kelsen (2006).

It is clear that democracy based on human rights values freedom. The freedom that underlies democratic freedoms must be positive and responsible, not the anarchic freedom. Freedom or independence in a democracy must sustain and protect democracy with all the human rights contained therein. Independence in favor of democracy and have the power to protect democracy from threats that can destroy democracy itself. Democracy also hinted that the highest honor the sovereignty of the People. In the learning process in the classroom should be understood that the people here can be interpreted student interests should come first, and given the freedom to communicate his opinions either directly or as a group represent an effort to train the courage to answer the question.

Much evidence suggests that the process of learning mathematics cannot be separated from other subjects, such as the example want to build a democratic mindset. To be able to build a democratic mindset, it must first be recognized by the teacher that the teacher is not the only resource, the teacher only serves as a lighter development of students' abilities. Students should be given the opportunity to enjoy a fun learning so do not feel pressured and scared. With a fun learning expected of students can benefit from learning mathematics, began utilizing interactive CD freedom, courage communicate the content of the material as it is understood, the freedom to answer questions. All the freedom and courage that has made students, it is definitely accompanied with consequences as a responsibility of the selected attitude.

### **3. Research Methods**

I did the research method is action research in the fourth class of elementary school. I am interested in this study because it can know real situation in the classroom, both in terms of strengths and the weaknesses of each student's ability, especially on indicators or material fractions. My approach comes from a sense of sincerity that aims to make this worth a fraction

of material easy to understand and meaningful students to complete similar problems are also significant in dealing with everyday problems. After I think about it turns out that I did have to use that should be used is scientific or scientific approach. As sensitivity observed that before the material taught each student was given a CD to be studied at home and ensured they were able to operate it.

When the next day learning activities, teachers form groups randomly ask anyone who already knows it and who is not. If the student has been asked to present the results of reasoning, then try to write on the board at once communicate the results of their study and other students are given the opportunity to respond properly and absence of the submission of the students who had ventured forward. For students who have not had time to open the contents of the material, the teacher still has not had time to ask why, what constraints are the cause. Teachers are required to promptly provide a solution, if it does not have a computer can join the study with students who have computers or can be hired at the cafe (computer shop).

During the learning process takes place, I am reflecting on failures and successes that I have done. Patterns of behavior can be known from the beginning to emerge curiosity about the contents of the material. Action pattern can be obtained from the ability to operate a computer to learn the material fractions. Indirectly, the students woke democratic mindset, meaning that when the student is able to use to develop a positive attitude curiosity then it is definitely going to increase the experience and knowledge. For students who neglect then it is definitely not know the content of the material to be covered that day.

In the process of learning nextis repair, in addition to the student awoke mindset worth of knowledge about fractions and fractions are not valued, students also will wake patterns to boldly honest attitude that students really have not studied the material on the CD. Furthermore, students are not directly waking patterns also follow to immediately make changes to open up and learn the material fractions worth.

Although only eight meetings, the fourth grade students have been able to show the changes and developments that have a democratic mindset more than 10% (5 of 40 students). In a democratic mindset, students have had the courage opinion, have been willing to listen to opinions of other friends, have dared to ask and be able to convey ideas different from his other.

#### **4. Results and Discussion**

The results showed that the action research, the fourth grade students were initially less attention or crowded themselves if there is information, be willing to listen when the change will parcel interactive CD. Students who usually becomes the listener, willing to turn into increasingly active and eager to learn the material worth of interactive CD fraction math. Given the motivation and opportunity for learning the next day, students who typically explored actively become increasingly bold about what has been his ability to understand the material after opening as a representative of a group of students, while others explore the ability to respond. As found fragments were worth as much as possible: half = two quarter = three sixths = five tenths and so on. When students venture forth express an opinion on behalf of itself and represents the group mean students have awakened democratic mindset and this

requires courage as rewards in the form of praise. The ability of other students in attention and dare to ask where the answer is obtained, it is also a democratic mindset that should always be built and developed, not to be turned off by the teacher.

## **5. Conclusions and Recommendations**

In action research that I have done can be concluded that the use of an interactive CD mathematical fractions containing material worth covering fractions and comparing fractions, was able to build democratic mindset. Data obtained from the corrective action on the process of learning, it was found that students with a scientific approach may turn out to be more daring forward ideas, able to maintain his opinion when it was believed to be correct opinion. In this case required experienced teachers and professionals, who will be able to capture the establishment of a democratic mindset of the students, the pattern of attitudes and action pattern. Students who have a high curiosity to learn the spirit of the material, conveying the spirit of what is already known, have the courage to ask, has the ability to choose a positive attitude.

Ability to "capture" the ability of the teacher is not automatic, but it needs to be sharpened. Coaching and training with supervision to motivate educators to complete professionalism. Furthermore, an interactive CD math can actually to build a democratic mindset for students in any education level, but it takes a professional teacher who are able to inspire them.

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